

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A holographic recording medium comprising:
a recording layer having an interference pattern recorded thereon using object light and reference light emitted from a laser light source; and
a servo layer formed ~~on a light incident side of~~ above the recording layer so as to face a direction of incident light, the servo layer having convexities and concavities that impart ~~having~~ one of wavelength selectivity and incident angle selectivity, each of the wavelength selectivity and the incident angle selectivity allowing the object light and the reference light to pass through the servo layer,
wherein the servo layer reflects servo light having a wavelength different from a wavelength of the object light and a wavelength of the reference light or the servo layer reflects servo light having an incident angle different from an incident angle of the object light and an incident angle of the reference light, and
one of servo information and address information is recorded on the servo layer.
2. (Canceled)
3. (Previously Presented) The holographic recording medium according to claim 1, wherein the servo layer is a phase type reflection hologram that comprises a planar diffraction grating having a constant grating space, and the servo layer reflects the incident servo light satisfying the Bragg condition and allows the object light and the reference light not satisfying the Bragg condition to pass through.

4. (Currently Amended) A holographic recording medium comprising:
a recording layer having an interference pattern recorded thereon using object
light and reference light emitted from a laser light source; and
a servo layer formed above the recording layer so as to face a direction of
incident light, the servo layer having one of wavelength selectivity and incident angle
selectivity, each of the wavelength selectivity and the incident angle selectivity allowing the
object light and the reference light to pass through the servo layer,
wherein the servo layer reflects servo light having a wavelength different from
a wavelength of the object light and a wavelength of the reference light or the servo layer
reflects servo light having an incident angle different from an incident angle of the object
light and an incident angle of the reference light,
one of servo information and address information is recorded on the servo
layer, and~~The holographic recording medium according to claim 1, wherein~~
the servo layer is formed of a diffraction grating having a multilayer spheric
shape and a constant grating space.

5. (Previously Presented) The holographic recording medium according to claim 3, wherein: the servo layer is composed of a photosensitive material having a refractive index modulated by light irradiation; and the incident angle selectivity is imparted to the servo layer by setting a maximum refractive index modulation factor of the photosensitive material to 0.005 or more and 0.01 or less and a thickness of the servo layer to 5 μm or more and less than 20 μm .

6. (Previously Presented) The holographic recording medium according to claim 3, wherein: the servo layer is composed of a photosensitive material having a refractive index modulated by light irradiation; and the wavelength selectivity is imparted to the servo layer by setting a maximum refractive index modulation factor of the photosensitive material to

0.0008 or more and 0.005 or less and a thickness of the servo layer to 20 μm or more and 100 μm or less.

7. (Previously Presented) A method for manufacturing a servo layer of a holographic recording medium, the method comprising:

allowing coherent plane wave laser light beams having the same wavelength to be vertically incident on both sides of the servo layer composed of a material capable of forming a reflection type diffraction grating by interference fringes of two laser light beams to thereby form, inside the servo layer, a planar diffraction grating having a constant grating space; and

laminating the servo layer having the planar diffraction grating formed therein on a recording layer formed on a substrate via a spacer layer.

8. (Previously Presented) A method for manufacturing servo layers of a holographic recording medium, the method comprising:

arranging a servo layer on both sides of an interference control mask with the interference control mask sandwiched therebetween, each servo layer composed of a material capable of forming a reflection type diffraction grating by interference fringes of two laser light beams;

irradiating two laser light beams split by a beam splitter from both sides of a pair of the servo layers such that the interference control mask serves as a common focal point to thereby form in each of the servo layers a spheric diffraction grating in which the common focal point serves as a sphere center and a symmetry center;

stripping both the servo layers from the interference control mask; and

applying both the servo layers to a spacer layer of a laminate, the laminate configured by laminating a substrate, a holographic recording layer, and the spacer layer in this order.

9. (Previously Presented) A holographic recording-reproducing optical system, comprising:

the holographic recording medium according to claim 1;

a servo optical system including a beam splitter that branches off a portion of light to form servo light incident on the holographic recording medium at nearly right angles to the servo layer;

a polarizing beam splitter which splits the light branched off in a direction different from that of the servo light by the beam splitter into two linearly polarized light beams having orthogonal vibration planes;

a reference optical system which allows one of the linearly polarized light beams split by the polarizing beam splitter to be incident on the holographic recording medium as reference light from a direction different from that of the servo light;

an object optical system which allows the other of the linearly polarized light beams split by the polarizing beam splitter to be incident on the holographic recording medium as object light from a direction different from that of the servo light and the reference light; and

a photodetector which detects the reflection of the servo light from the servo layer, wherein:

the reference optical system comprises, in order from a polarizing beam splitter side, a $1/2$ wave plate and a Fourier lens;

the object optical system comprises, in order from the polarizing beam splitter side, a spatial light modulator for modulating the linearly polarized light beam according to information to be recorded and a Fourier lens;

the servo optical system comprises, in order from a beam splitter side, a second polarizing beam splitter, a $1/4$ wave plate, and a condensing lens;

the second polarizing beam splitter allows one of two linearly polarized light beams having orthogonal vibration planes to pass through and reflects the other; and

the photodetector is provided on a reflection optical path which is formed when the reflection of the servo light from the servo layer is incident on the second polarizing beam splitter, the servo light being incident on the servo layer after passing through the second polarizing beam splitter.

10. (Previously Presented) The holographic recording medium according to claim 4, wherein: the servo layer is composed of a photosensitive material having a refractive index modulated by light irradiation; and the incident angle selectivity is imparted to the servo layer by setting a maximum refractive index modulation factor of the photosensitive material to 0.005 or more and 0.01 or less and a thickness of the servo layer to 5 μm or more and less than 20 μm .

11. (Previously Presented) The holographic recording medium according to claim 4, wherein: the servo layer is composed of a photosensitive material having a refractive index modulated by light irradiation; and the wavelength selectivity is imparted to the servo layer by setting a maximum refractive index modulation factor of the photosensitive material to 0.0008 or more and 0.005 or less and a thickness of the servo layer to 20 μm or more and 100 μm or less.

12. (Currently Amended) A holographic recording-reproducing optical system, comprising:

a holographic recording medium including:

a recording layer having an interference pattern recorded thereon using object light and reference light emitted from a laser light source; and

a servo layer formed above the recording layer so as to face a direction of incident light, the servo layer having one of wavelength selectivity and incident angle selectivity, each of the wavelength selectivity and the incident angle selectivity allowing the object light and the reference light to pass through the servo layer,

wherein the servo layer reflects servo light having a wavelength different from a wavelength of the object light and a wavelength of the reference light or the servo layer reflects servo light having an incident angle different from an incident angle of the object light and an incident angle of the reference light,

one of servo information and address information is recorded on the servo layer, and

the servo layer is constituted by any of a phase type reflection hologram, a dielectric multilayer film, and a dichroic mirror;~~the holographic recording medium according to claim 2;~~

the holographic recording-reproducing optical system further comprising:

a servo optical system including a beam splitter that branches off a portion of light to form servo light incident on the holographic recording medium at nearly right angles to the servo layer;

a polarizing beam splitter which splits the light branched off in a direction different from that of the servo light by the beam splitter into two linearly polarized light beams having orthogonal vibration planes;

a reference optical system which allows one of the linearly polarized light beams split by the polarizing beam splitter to be incident on the holographic recording medium as reference light from a direction different from that of the servo light;

an object optical system which allows the other of the linearly polarized light beams split by the polarizing beam splitter to be incident on the holographic recording

medium as object light from a direction different from that of the servo light and the reference light; and

a photodetector which detects the reflection of the servo light from the servo layer, wherein:

the reference optical system comprises, in order from a polarizing beam splitter side, a 1/2 wave plate and a Fourier lens;

the object optical system comprises, in order from the polarizing beam splitter side, a spatial light modulator for modulating the linearly polarized light beam according to information to be recorded and a Fourier lens;

the servo optical system comprises, in order from a beam splitter side, a second polarizing beam splitter, a 1/4 wave plate, and a condensing lens;

the second polarizing beam splitter allows one of two linearly polarized light beams having orthogonal vibration planes to pass through and reflects the other; and

the photodetector is provided on a reflection optical path which is formed when the reflection of the servo light from the servo layer is incident on the second polarizing beam splitter, the servo light being incident on the servo layer after passing through the second polarizing beam splitter.

13. (Previously Presented) A holographic recording-reproducing optical system, comprising:

the holographic recording medium according to claim 3;

a servo optical system including a beam splitter that branches off a portion of light to form servo light incident on the holographic recording medium at nearly right angles to the servo layer;

a polarizing beam splitter which splits the light branched off in a direction different from that of the servo light by the beam splitter into two linearly polarized light beams having orthogonal vibration planes;

a reference optical system which allows one of the linearly polarized light beams split by the polarizing beam splitter to be incident on the holographic recording medium as reference light from a direction different from that of the servo light;

an object optical system which allows the other of the linearly polarized light beams split by the polarizing beam splitter to be incident on the holographic recording medium as object light from a direction different from that of the servo light and the reference light; and

a photodetector which detects the reflection of the servo light from the servo layer, wherein:

the reference optical system comprises, in order from a polarizing beam splitter side, a $1/2$ wave plate and a Fourier lens;

the object optical system comprises, in order from the polarizing beam splitter side, a spatial light modulator for modulating the linearly polarized light beam according to information to be recorded and a Fourier lens;

the servo optical system comprises, in order from a beam splitter side, a second polarizing beam splitter, a $1/4$ wave plate, and a condensing lens;

the second polarizing beam splitter allows one of two linearly polarized light beams having orthogonal vibration planes to pass through and reflects the other; and

the photodetector is provided on a reflection optical path which is formed when the reflection of the servo light from the servo layer is incident on the second polarizing beam splitter, the servo light being incident on the servo layer after passing through the second polarizing beam splitter.

14. (Previously Presented) A holographic recording-reproducing optical system, comprising:

the holographic recording medium according to claim 4;

a servo optical system including a beam splitter that branches off a portion of light to form servo light incident on the holographic recording medium at nearly right angles to the servo layer;

a polarizing beam splitter which splits the light branched off in a direction different from that of the servo light by the beam splitter into two linearly polarized light beams having orthogonal vibration planes;

a reference optical system which allows one of the linearly polarized light beams split by the polarizing beam splitter to be incident on the holographic recording medium as reference light from a direction different from that of the servo light;

an object optical system which allows the other of the linearly polarized light beams split by the polarizing beam splitter to be incident on the holographic recording medium as object light from a direction different from that of the servo light and the reference light; and

a photodetector which detects the reflection of the servo light from the servo layer, wherein:

the reference optical system comprises, in order from a polarizing beam splitter side, a $1/2$ wave plate and a Fourier lens;

the object optical system comprises, in order from the polarizing beam splitter side, a spatial light modulator for modulating the linearly polarized light beam according to information to be recorded and a Fourier lens;

the servo optical system comprises, in order from a beam splitter side, a second polarizing beam splitter, a $1/4$ wave plate, and a condensing lens;

the second polarizing beam splitter allows one of two linearly polarized light beams having orthogonal vibration planes to pass through and reflects the other; and

the photodetector is provided on a reflection optical path which is formed when the reflection of the servo light from the servo layer is incident on the second polarizing beam splitter, the servo light being incident on the servo layer after passing through the second polarizing beam splitter.

15. (Previously Presented) A holographic recording-reproducing optical system, comprising:

the holographic recording medium according to claim 5;

a servo optical system including a beam splitter that branches off a portion of light to form servo light incident on the holographic recording medium at nearly right angles to the servo layer;

a polarizing beam splitter which splits the light branched off in a direction different from that of the servo light by the beam splitter into two linearly polarized light beams having orthogonal vibration planes;

a reference optical system which allows one of the linearly polarized light beams split by the polarizing beam splitter to be incident on the holographic recording medium as reference light from a direction different from that of the servo light;

an object optical system which allows the other of the linearly polarized light beams split by the polarizing beam splitter to be incident on the holographic recording medium as object light from a direction different from that of the servo light and the reference light; and

a photodetector which detects the reflection of the servo light from the servo layer, wherein:

the reference optical system comprises, in order from a polarizing beam splitter side, a $1/2$ wave plate and a Fourier lens;

the object optical system comprises, in order from the polarizing beam splitter side, a spatial light modulator for modulating the linearly polarized light beam according to information to be recorded and a Fourier lens;

the servo optical system comprises, in order from a beam splitter side, a second polarizing beam splitter, a $1/4$ wave plate, and a condensing lens;

the second polarizing beam splitter allows one of two linearly polarized light beams having orthogonal vibration planes to pass through and reflects the other; and

the photodetector is provided on a reflection optical path which is formed when the reflection of the servo light from the servo layer is incident on the second polarizing beam splitter, the servo light being incident on the servo layer after passing through the second polarizing beam splitter.

16. (Previously Presented) A holographic recording-reproducing optical system, comprising:

the holographic recording medium according to claim 6;

a servo optical system including a beam splitter that branches off a portion of light to form servo light incident on the holographic recording medium at nearly right angles to the servo layer;

a polarizing beam splitter which splits the light branched off in a direction different from that of the servo light by the beam splitter into two linearly polarized light beams having orthogonal vibration planes;

a reference optical system which allows one of the linearly polarized light beams split by the polarizing beam splitter to be incident on the holographic recording medium as reference light from a direction different from that of the servo light;

an object optical system which allows the other of the linearly polarized light beams split by the polarizing beam splitter to be incident on the holographic recording medium as object light from a direction different from that of the servo light and the reference light; and

a photodetector which detects the reflection of the servo light from the servo layer, wherein:

the reference optical system comprises, in order from a polarizing beam splitter side, a 1/2 wave plate and a Fourier lens;

the object optical system comprises, in order from the polarizing beam splitter side, a spatial light modulator for modulating the linearly polarized light beam according to information to be recorded and a Fourier lens;

the servo optical system comprises, in order from a beam splitter side, a second polarizing beam splitter, a 1/4 wave plate, and a condensing lens;

the second polarizing beam splitter allows one of two linearly polarized light beams having orthogonal vibration planes to pass through and reflects the other; and

the photodetector is provided on a reflection optical path which is formed when the reflection of the servo light from the servo layer is incident on the second polarizing beam splitter, the servo light being incident on the servo layer after passing through the second polarizing beam splitter.

17. (Previously Presented) The holographic recording medium according to claim 1, wherein: the servo layer is composed of a photosensitive material having a refractive index modulated by light irradiation; and the incident angle selectivity is imparted to the servo layer by setting a maximum refractive index modulation factor of the photosensitive material to 0.005 or more and 0.01 or less and a thickness of the servo layer to 5 μm or more and less than 20 μm .

18. (Previously Presented) The holographic recording medium according to claim 1, wherein: the servo layer is composed of a photosensitive material having a refractive index modulated by light irradiation; and the wavelength selectivity is imparted to the servo layer by setting a maximum refractive index modulation factor of the photosensitive material to 0.0008 or more and 0.005 or less and a thickness of the servo layer to 20 μm or more and 100 μm or less.